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Chavez

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(54) **TRAILER BED FRAME STRAIGHTENER**

(76) Inventor: **Isidro Chavez**, Brentwood, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 945 days.

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(22) Filed: **Apr. 5, 2007**

(51) **Int. Cl.**
B21D 37/12 (2006.01)
B21C 1/00 (2006.01)

(52) **U.S. Cl.** **72/455**; 72/705

(58) **Field of Classification Search** 72/413, 72/447, 457, 466.7, 705, 455, 456; 29/251
See application file for complete search history.

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U.S. PATENT DOCUMENTS

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3,377,834	A	4/1968	Latuff et al.	
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4,466,268	A	8/1984	Matson, Sr.	
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4,574,614	A *	3/1986	Field	72/447
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4,700,559	A	10/1987	Larson et al.	
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5,257,526	A	11/1993	Teixeria	
5,819,576	A	10/1998	Smith, Jr.	
7,104,107	B2 *	9/2006	Buckler et al.	72/447

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EP	0172290	4/1984

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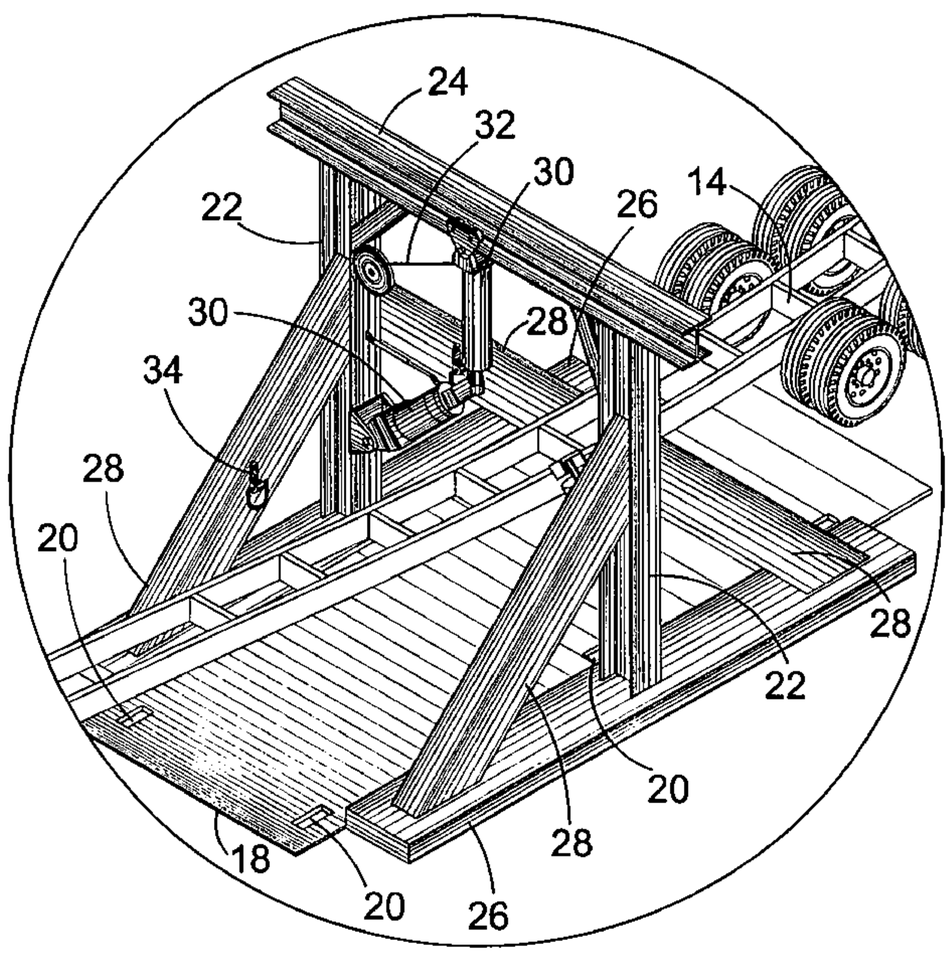
Primary Examiner — Teresa M Bonk
(74) *Attorney, Agent, or Firm* — Michael I Kroll

(57) **ABSTRACT**

A device for re-shaping a trailer frame includes a support structure for receiving the trailer frame therein and means connected to the support structure for securing the trailer therein. Once secured, at least one hydraulic ram that is connected to and selectively moveable about the support structure is able to apply a predetermined force against the frame. A control device is positioned on the support structure and connected to the at least one hydraulic ram for controlling operation thereof. Upon securing the trailer via the securing means, the at least one hydraulic ram is positioned adjacent the frame and the control mechanism is selectively operable to cause the at least one hydraulic ram to apply the predetermined force on the frame thereby reshaping the frame.

15 Claims, 15 Drawing Sheets



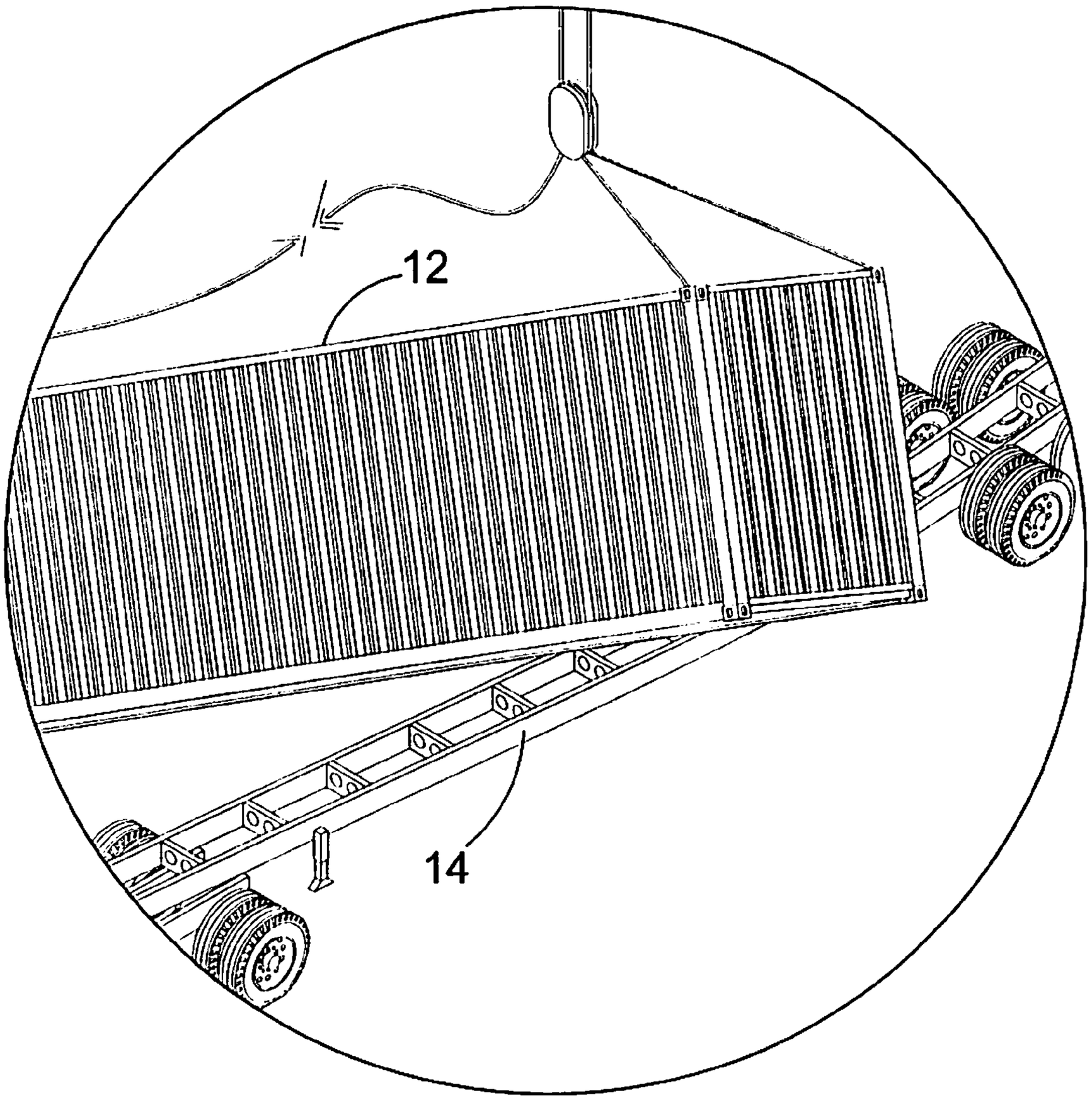


FIG. 1

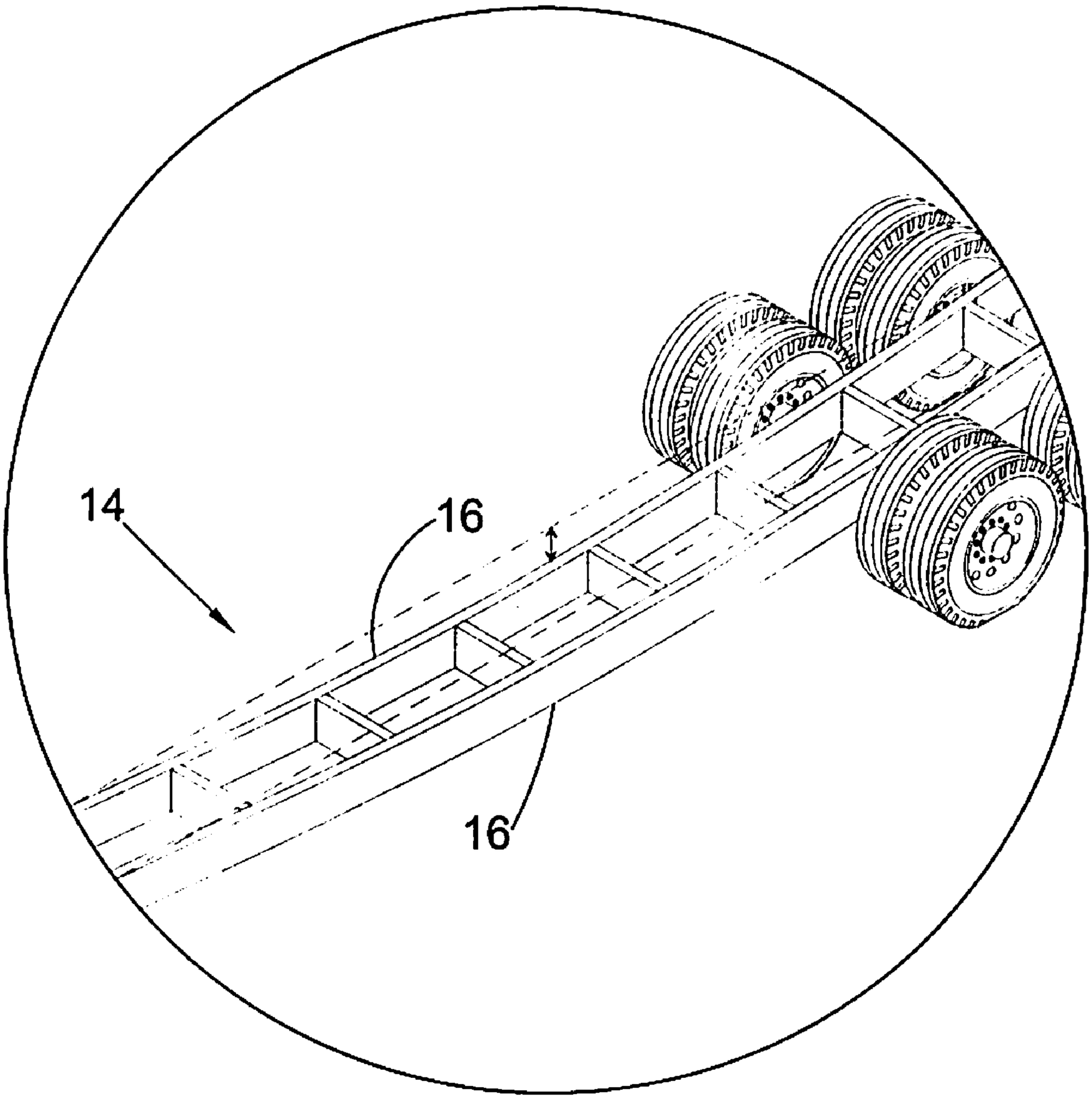
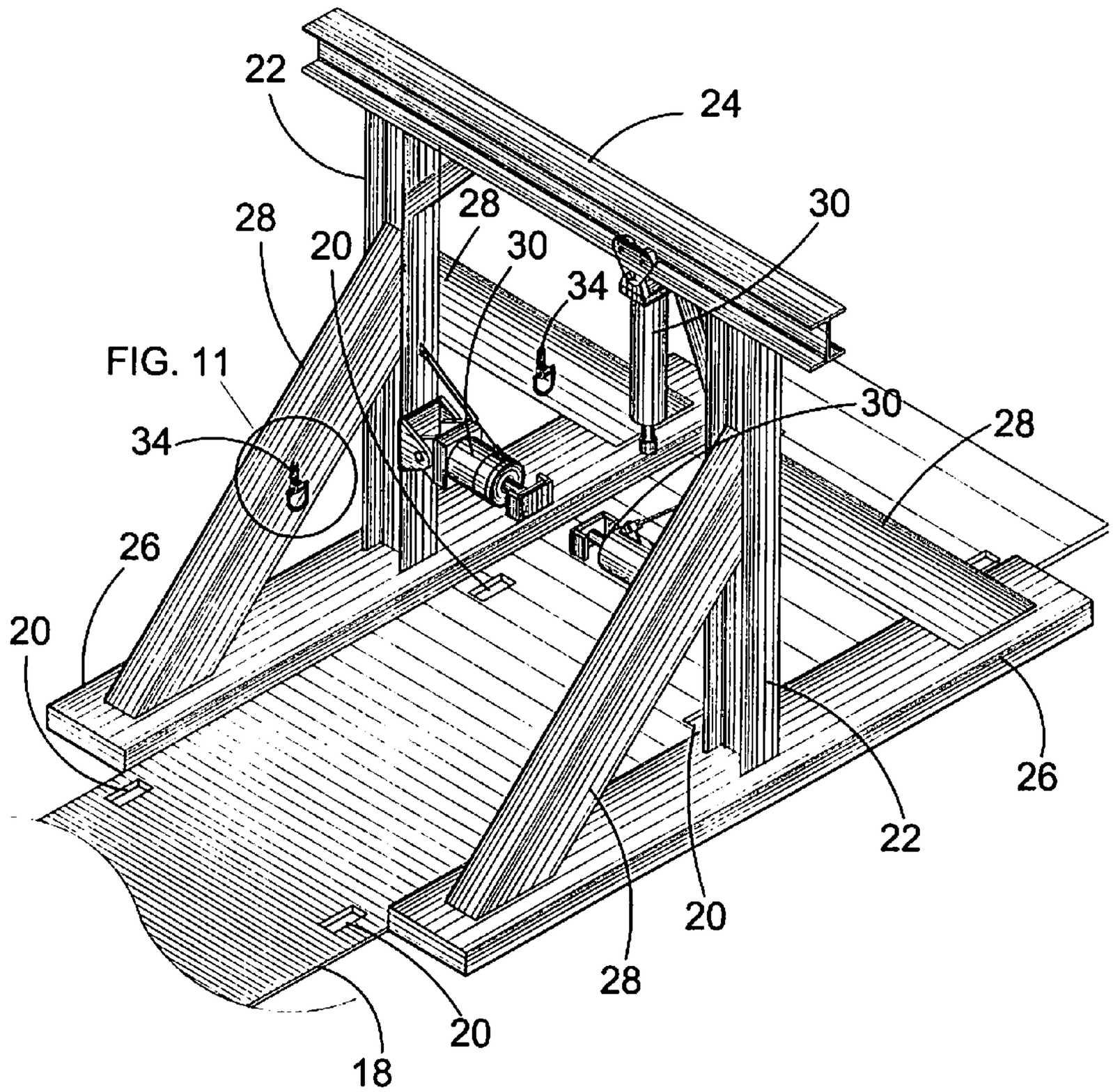


FIG. 2



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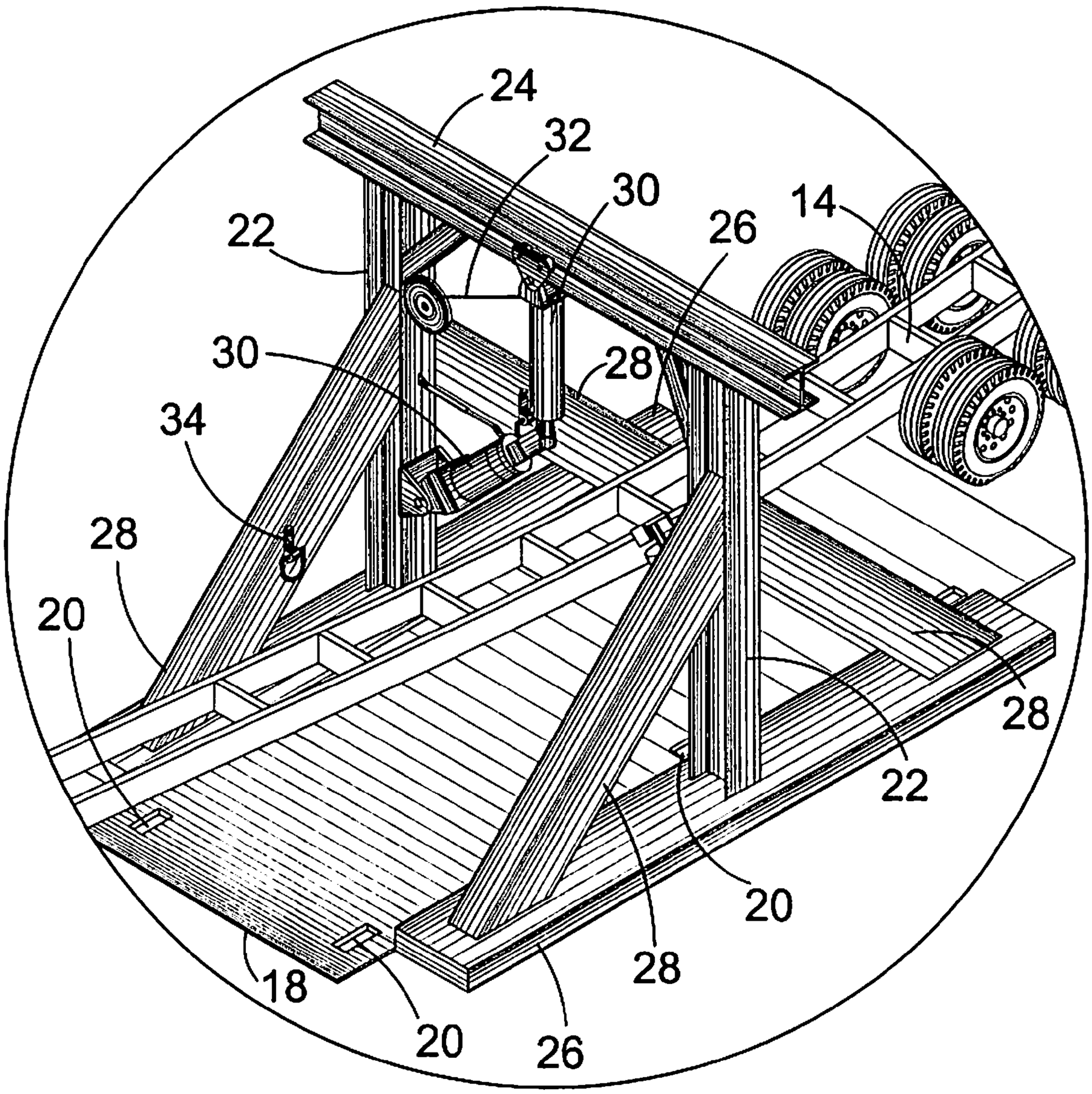

FIG. 4

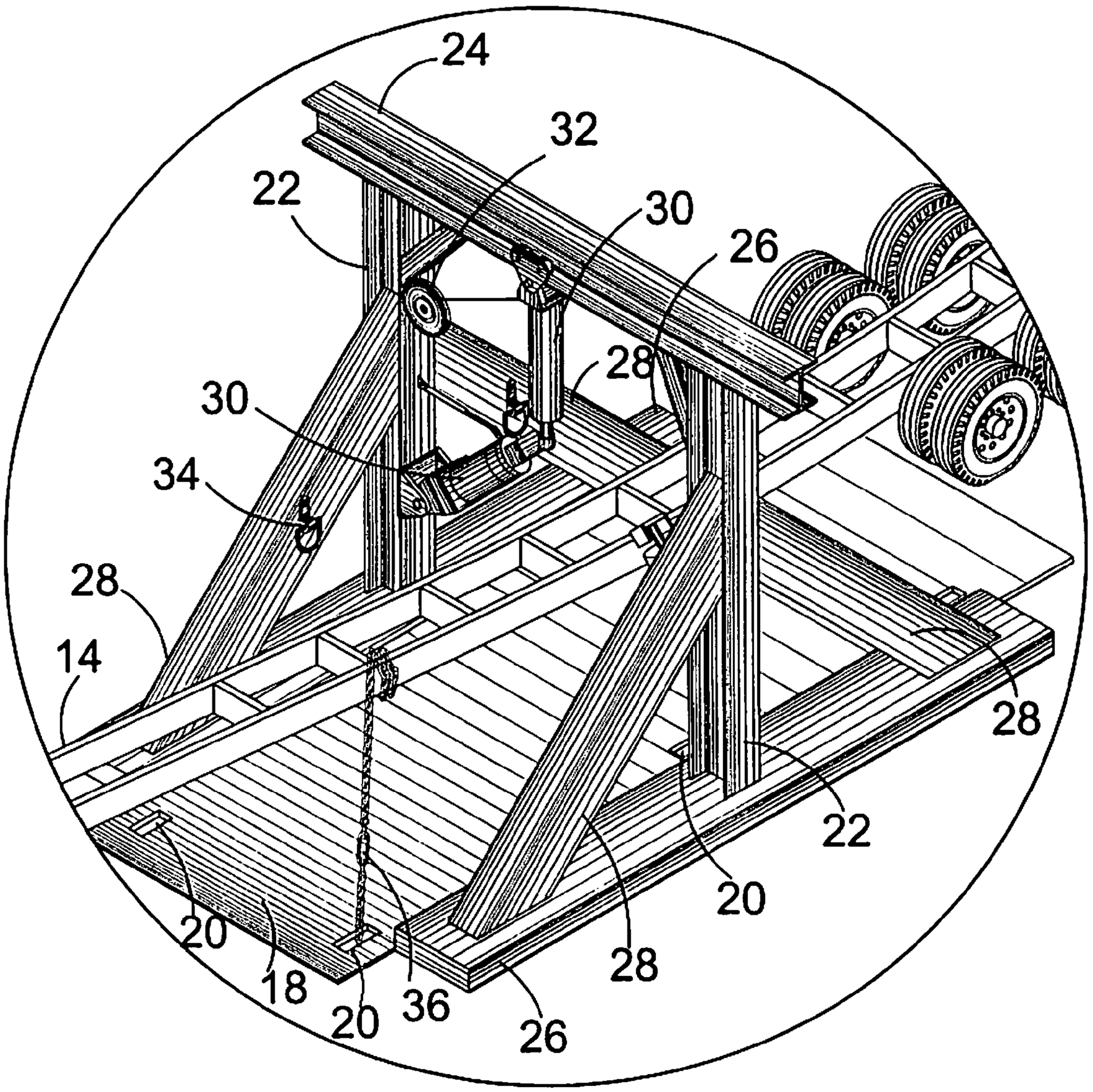

FIG. 5

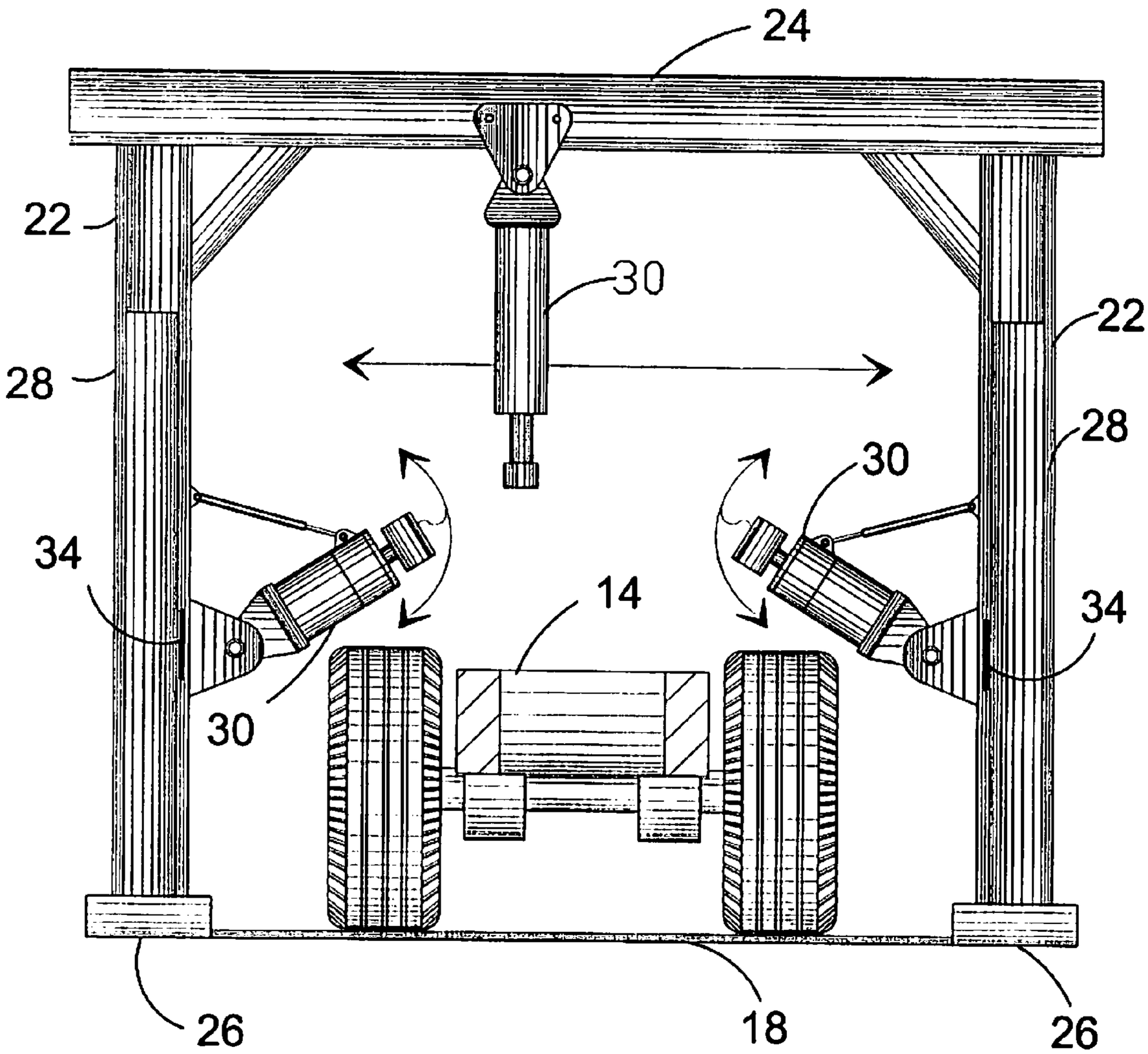

FIG. 6

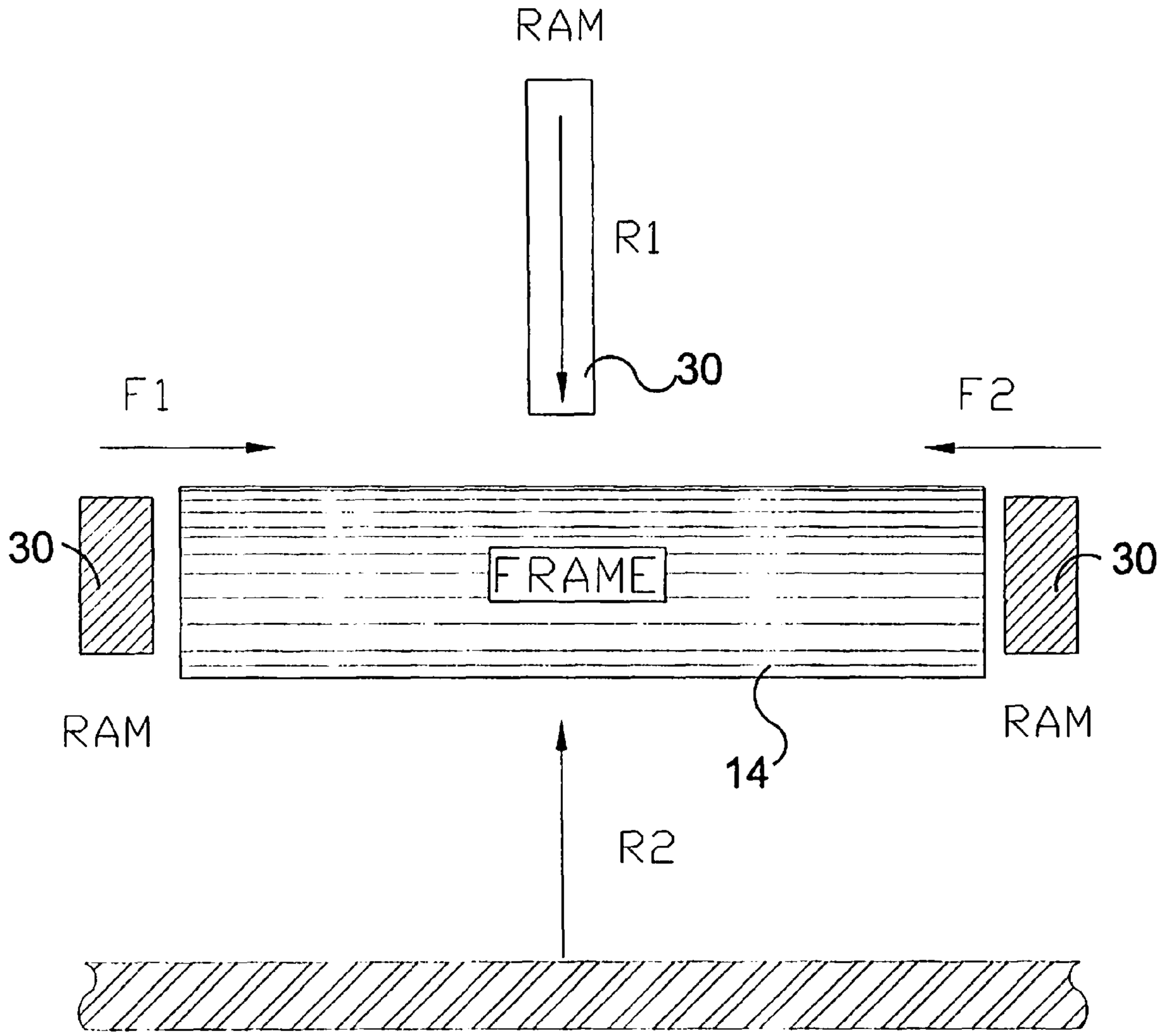

FIG. 7

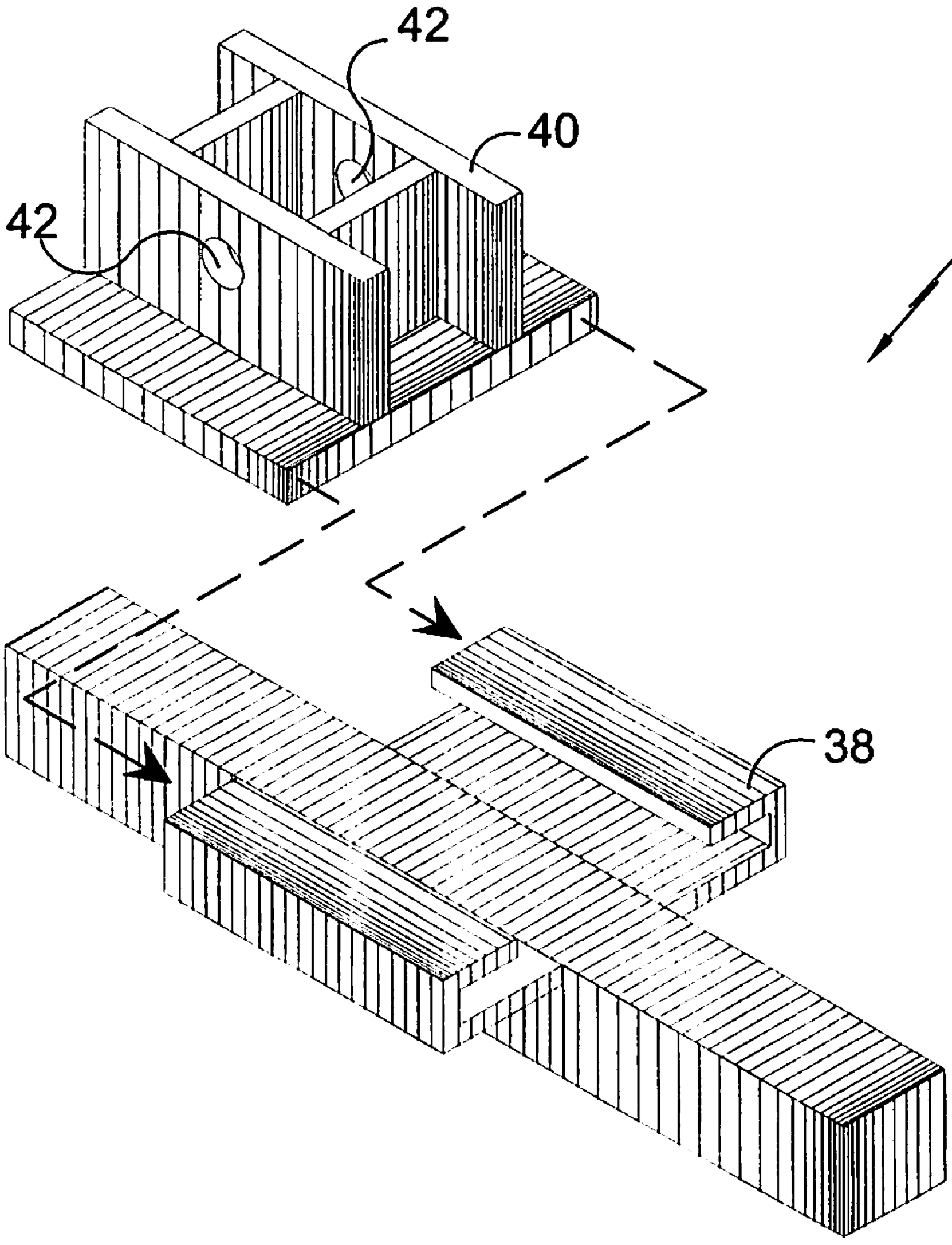

FIG. 8

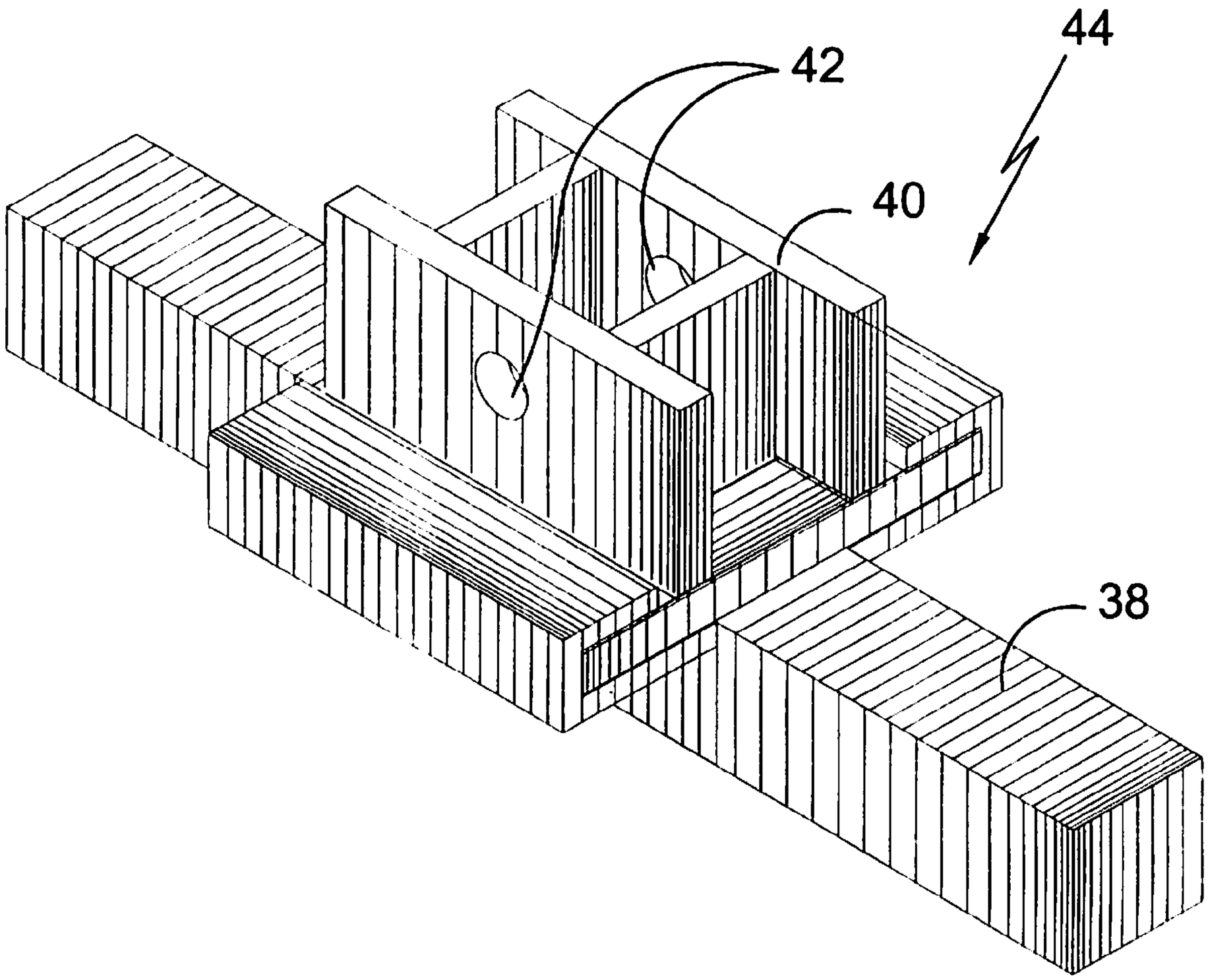

FIG. 9

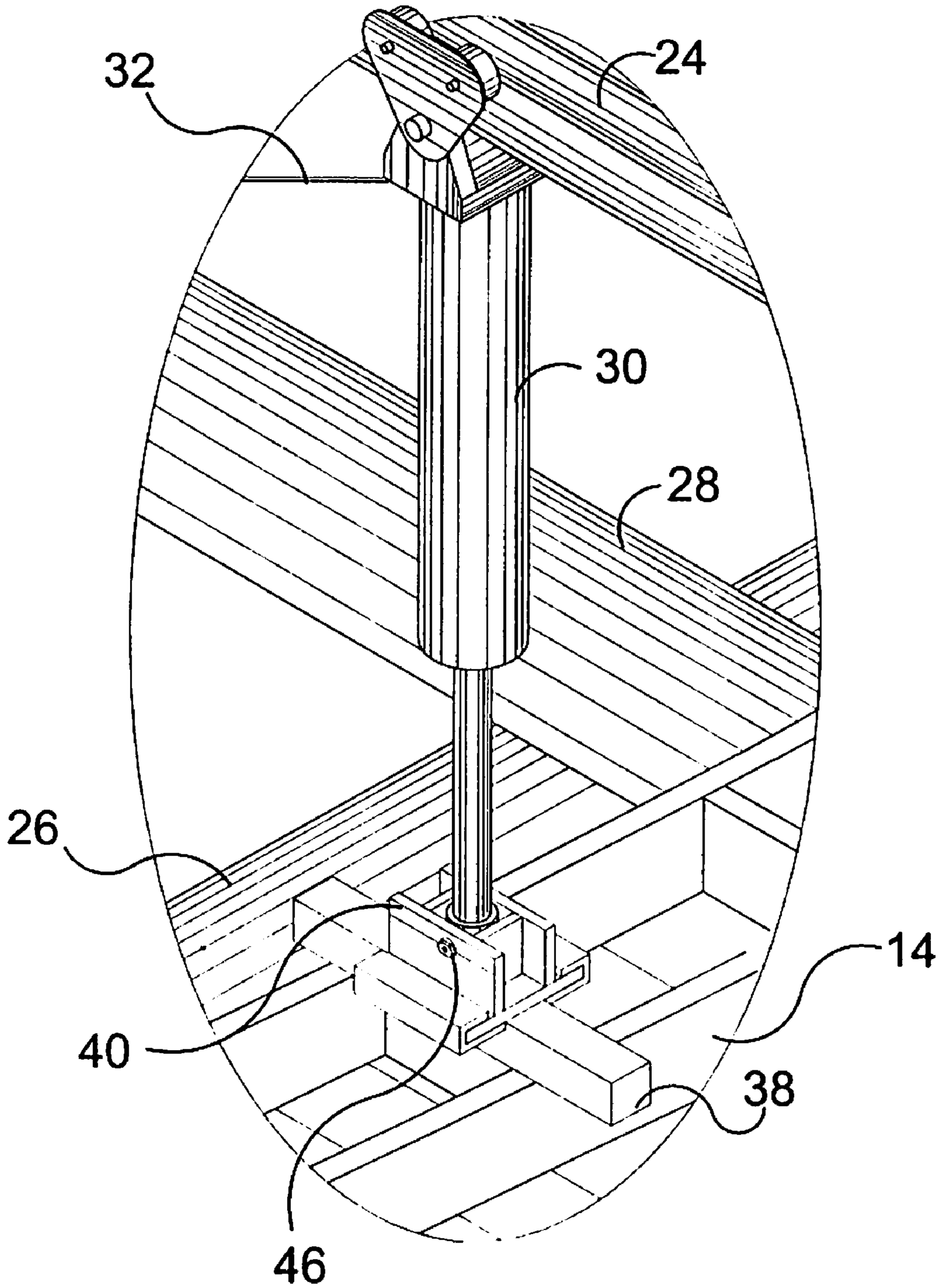

FIG. 10

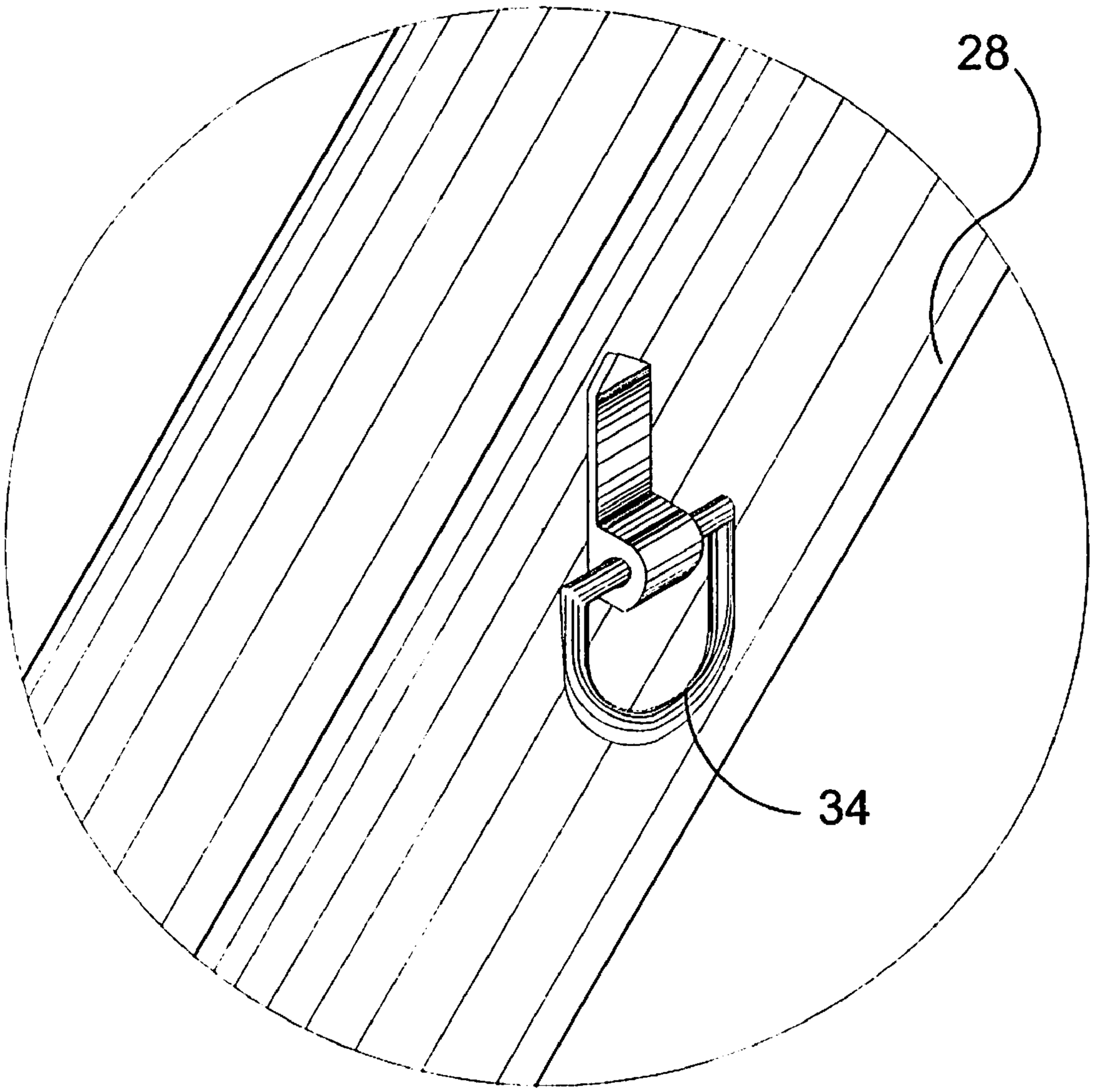

FIG. 11

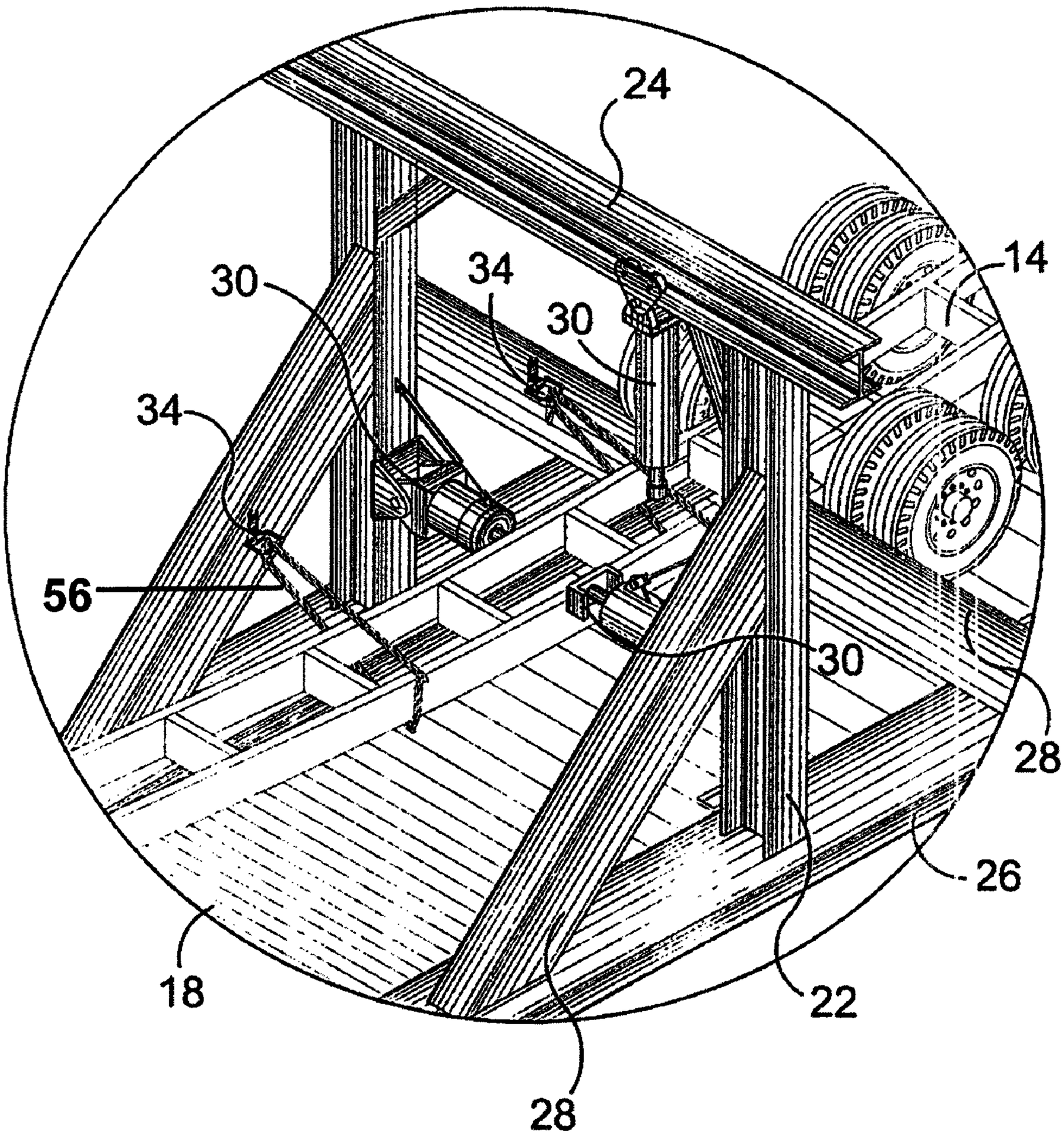

FIG. 12

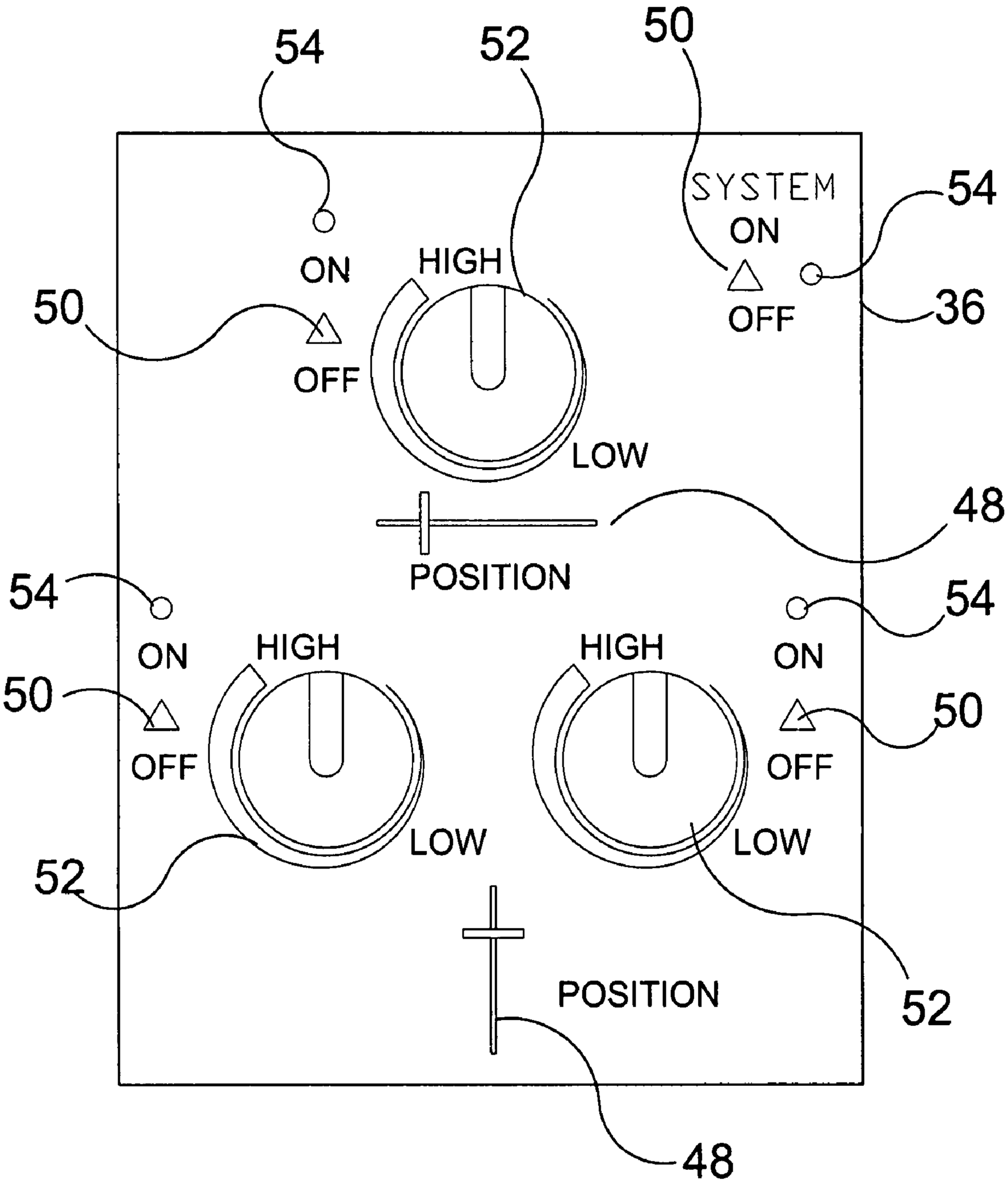
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FIG. 13

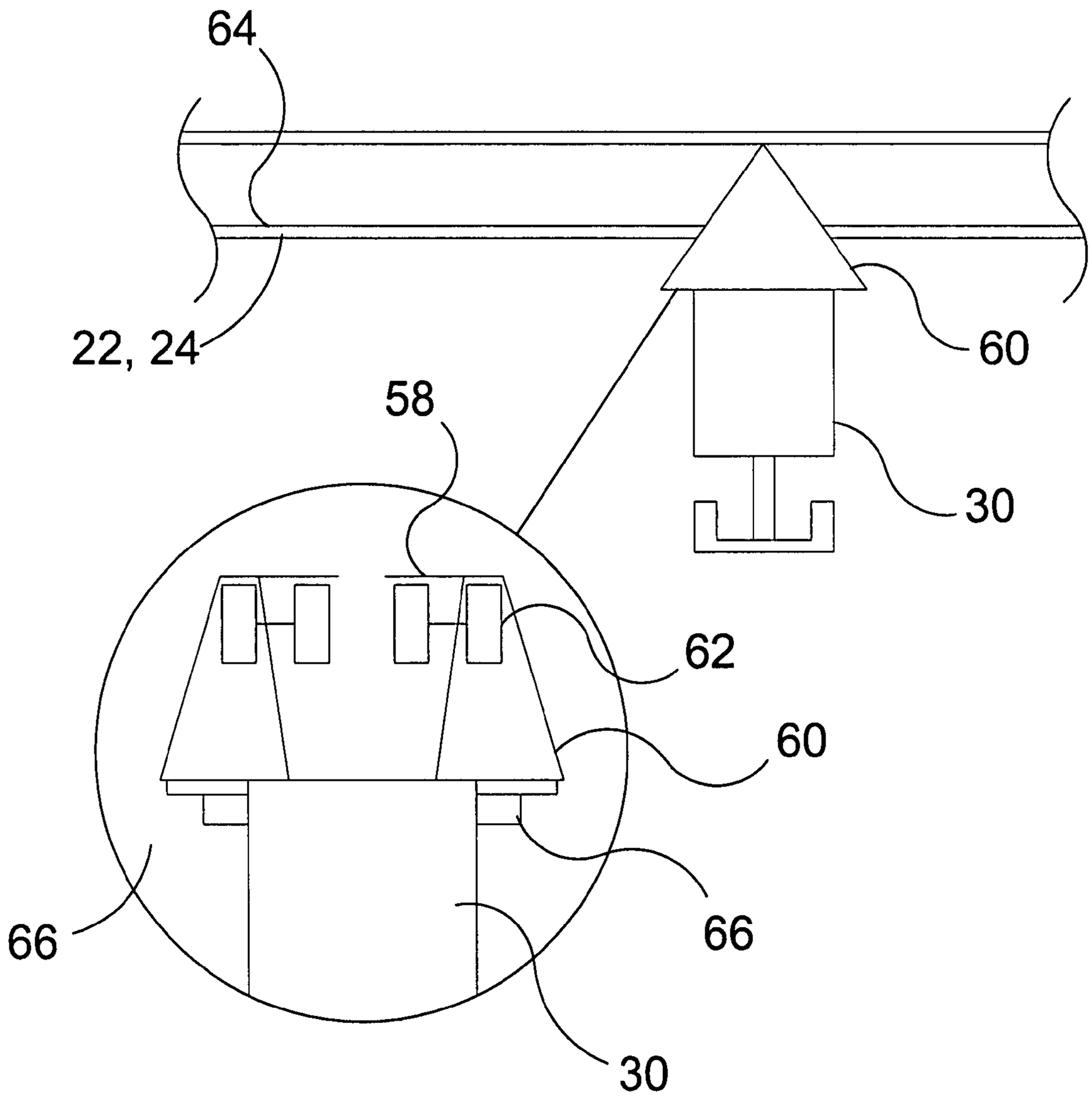

FIG. 14

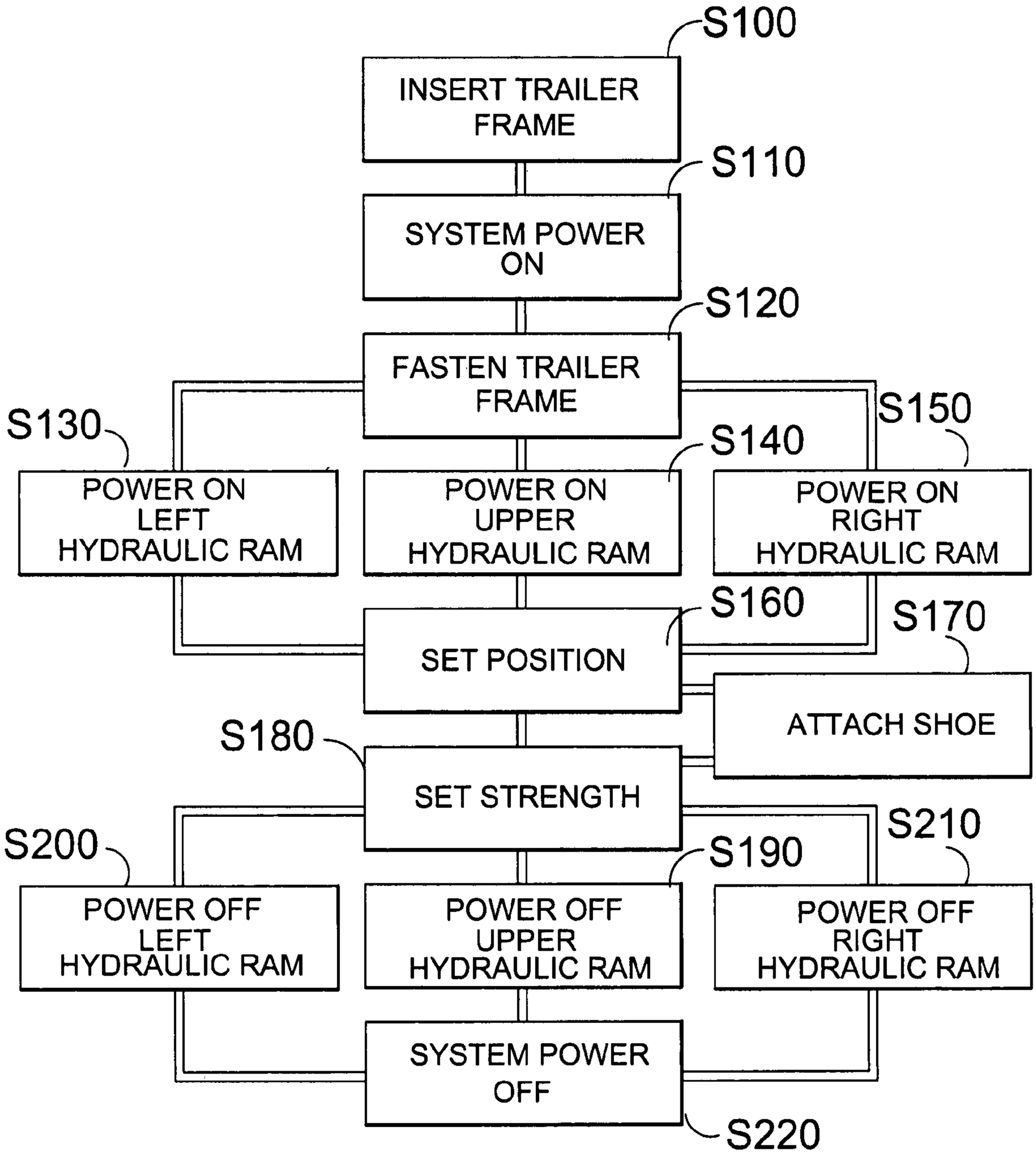
S100
INSERT TRAILER FRAME
S110
SYSTEM POWER ON
S120
FASTEN TRAILER FRAME
S130
POWER ON LEFT HYDRAULIC RAM
S140
POWER ON UPPER HYDRAULIC RAM
S150
POWER ON RIGHT HYDRAULIC RAM
S160
SET POSITION
S170
ATTACH SHOE
S180
SET STRENGTH
S200
POWER OFF LEFT HYDRAULIC RAM
S190
POWER OFF UPPER HYDRAULIC RAM
S210
POWER OFF RIGHT HYDRAULIC RAM
SYSTEM POWER OFF
S220

FIG. 15

TRAILER BED FRAME STRAIGHTENER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to trailer bed frames and, more specifically, to a straightening system for trailer bed frames which have bent out of shape over time. The present invention is comprised of hydraulic rams, fastening elements, a control panel and a support structure. A bent trailer bed frame is secured to the support structure by the fastening elements. The bent trailer frame is straightened in response to the input of controls provided by the control panel. The control panel provides the user with control over the position and power of the hydraulic rams connected to the support structure. The force exerted by the hydraulic rams straightens the bent trailer frame.

2. Description of the Prior Art

There are other frame straightening devices designed for motor vehicles. Typical of these is U.S. Pat. No. 1,773,187 issued to Johnson on Aug. 19, 1930.

Another patent was issued to Merrill et al. on Jun. 1, 1948 as U.S. Pat. No. 2,442,425. Yet another U.S. Pat. No. 2,717,020 was issued to Dobias on Sep. 6, 1955 and still yet another was issued on Apr. 16, 1968 to Latuff et al. as U.S. Pat. No. 3,377,834.

Another patent was issued to Chisum on Feb. 13, 1979 as U.S. Pat. No. 4,138,876. Yet another U.S. Pat. No. 4,466,268 was issued to Matson, Sr. on Aug. 21, 1984. Another was issued to Field on Oct. 15, 1985 as U.S. Pat. No. 4,546,638 and still yet another was issued on Oct. 20, 1987 to Larson et al. as U.S. Pat. No. 4,700,559.

Another patent was issued to Teixeria on Nov. 2, 1993 as U.S. Pat. No. 5,257,526. Yet another U.S. Pat. No. 5,819,576 was issued to Smith, Jr. on Oct. 13, 1998. Another was issued to Mora Agudo on Apr. 27, 2004 as European Publication No. EP0172290 and still yet another was issued on May 10, 1994 to Gemme as Canadian Patent No. CA1,329,357.

U.S. Pat. No. 1,773,187

Inventor: Emil Johnson

Issued: Aug. 19, 1930

In a device of the class described, the combination of a support; spaced apart tubular sockets provided in said support; vertical standpipes adapted to fit into said sockets; beams having spaced apart holes there through adapted to fit over said standpipes; tool-engaging members slidable on said beams, having holes therethrough; means to hold or move certain parts of an automobile.

U.S. Pat. No. 2,442,425

Inventor: Marcellus S. Merrill

Issued: Jun. 1, 1948

In apparatus of the character described, a rigid base frame including spaced, parallel, horizontally-disposed side members and posts supporting the ends of said side members, upper and lower, transverse, parallel members connecting between said posts and between corresponding ends of said side members, means for supporting a vehicle above said side members, a plurality of units independently shiftably longitudinally of said side members and each engageable with a vehicle frame for the application of transverse pressures thereto, and a rigid, upstanding post removably engageable with the transverse members at each end of said base frame and adjustable longitudinally of said transverse members for the application of tensile stresses to the vehicle frame members simultaneously with the application of transverse pressure thereto.

U.S. Pat. No. 2,717,020

Inventor: George L. Dobias

Issued: Sep. 6, 1955

A straightening apparatus of the character described comprising a pair of elongated runways, cross braces disposed beneath and secured to the ends of said runways and supporting the runways in elevated substantially parallel positions, a base member extending transversely, beneath said runways, means slidably connecting said base member to bottom portions of the runways for supporting the base member beneath the runways for sliding movement longitudinally thereof, a pair of uprights fixed to and raising from said base member, said uprights being disposed on outer sides of the runways, a pair of fluid pressure actuated rams, means detachably connected to and rising from said base member, said uprights before adjustably supporting said rams relatively to the uprights in desired positions to engage parts of a vehicle mounted on the runways between the uprights, a second base member disposed between corresponding ends of said runways and slidably supported on the cross brace supporting said runway ends for sliding movement of said second base member transversely of the runways, means retaining said second base member against swinging movement relatively to the runways, an upright fixed to and rising from said second base member and disposed beyond said runway ends, a third fluid pressure actuated ram, and means detachably and adjustably supporting said third ram on said last mentioned upright.

U.S. Pat. No. 3,377,834

Inventor: Joseph J. Latuff

Issued: Apr. 16, 1968

A vehicle frame straightening device comprising:

(a) upper and lower guide acting frame members each being in the form of a continuous uninterrupted portion of track having corresponding sides joined by curved portions to an end;

(b) means rigidly mounting said frame members in parallel, vertically spaced apart, generally horizontal positions;

(c) a vertically elongated subframe mounted in engagement with said frame members for horizontal, longitudinal movement thereon, said subframe having a portion thereof mounted for rotation about a vertical axis;

(d) power means mounted on said subframe for imparting a straightening force to said vehicle frame; and

(e) flexible connecting means for connecting said power means to said vehicle frame in cooperation with said rotatable portion of said subframe to direct the straightening force in any desired direction.

U.S. Pat. No. 4,138,876

Inventor: Finis L. Chisum

Issued: Feb. 13, 1979

A heavy duty truck liner for working on a truck, or large trailer, where a plurality of pulling and pushing operations are required to straighten a frame, etc. A plurality of tracks in the form of a rectangle surrounding the normal position of the truck and body is prepared and set into the concrete floor of the work room. A large inverted U-frame is set on rollers which are adapted to travel longitudinally along the long sides of the track. The frame is large enough to completely encircle the truck and body and can be moved readily along the track so as to be opposite any point on the side walls of the body where pulling or pushing operations are required. A folding platform is attached in a slidable manner to the sidewalls of the frame so as to position the platform at any level on either side of the body. Hydraulic locking means are provided to lock the frame in any selected position so as to withstand any pulling and pushing forces required. A plurality of robots are provided which are adapted to run on a second set of rails paralleling the first set which support the U-frame. Each of these robots is provided with a swivel table and a hydraulic crane so that it can be used to pick up loads, swing them to different positions and transport them along the rails, etc. The hydraulic crane can reach into the frame of the truck and pull, or push, as required, to provide straightening operations.

U.S. Pat. No. 4,466,268

Inventor: Robert P. Matson, Sr.

Issued: Aug. 21, 1984

A straightening apparatus for use in straightening the bent portions of vehicles including a support frame in which the vehicle is positionable; a pusher unit adjustably mounted on the support frame and adapted to engage the bent portion of the vehicle and applying a straightening force thereto in a first direction; and a backup unit adjustably mounted on the support frame and adapted to engage the vehicle in the vicinity of and in opposition to the pusher unit and apply backup forces to the vehicle oriented generally parallel to the straightening force and in a second direction opposite to the first direction so that the bent portion of the vehicle can be straightened back to its original shape without deformation of the unbent portions of the vehicle.

U.S. Pat. No. 4,546,638

Inventor: Carl R. Field

Issued: Oct. 15, 1985

An apparatus for repairing and straightening vehicles includes upper and lower tracks supported in vertically spaced relation by a frame, each track including a pair of laterally spaced apart and longitudinally extending side members. A plurality of tower assemblies are supported on the upper and lower tracks for longitudinal movement therealong. A pit is provided in which cross members support rails positioned directly under side bars of a truck vehicle for a tie-down to extend around the rails and to the vehicle side bars. A longitudinally moveable beam is provided between adjacent lower tracks and the pair of rails and is limited

against vertical movement by horizontal flanges facing each other on the tracks and pair of rails. A pulley on the moveable beam engages a tension member extending from the tower to the vehicle to provide a downward pull on the vehicle between the track members and the rails. The structure of the tower assembly allows for pulling on the vehicle frame only at a 90 degree angle, as the pulley on top of the cylinder is limited against turning. The chain is restricted to one side of the tower by a guide on the tower.

U.S. Pat. No. 4,700,559

Inventor: Byron A. Larson et al

Issued: Oct. 20, 1987

An apparatus for repairing a deformed, yieldable body of a motor vehicle. The apparatus includes a frame on which a raised platform is secured. To restrain the vehicle during the application of a restoring force, various appliances are attached at any location about the outer boundary of the platform and coupled to the motor vehicle. The appliances are adapted to be attachable to and releasable from the motor vehicle without requiring its movement. To apply the force necessary to restore the deformed, yieldable body of a motor vehicle, the apparatus includes pull-towers supported on and movable along a track provided by the frame. Each pull-tower includes a compact power head which can be moved vertically up or down the pull-tower. Activating the power head produces the force used in restoring the deformed, yieldable body of the motor vehicle.

U.S. Pat. No. 5,257,526

Inventor: Louis Teixeria

Issued: Nov. 2, 1993

Apparatus is disclosed for straightening the frame of a damaged vehicle and includes a bed on which the damaged vehicle is located during the frame straightening operation. A plurality of towers are mounted on the bed and are adjustably movable in a horizontal direction relative thereto. Some of the primary towers include a pushing and holding mechanism, and a pulling mechanism; while other towers include only a pushing and holding mechanism. The pushing and holding mechanism of a tower is operable to selectively push or hold a designated location of the damaged vehicle frame, and is simultaneously selectively operable with a pushing and holding mechanism and/or the pulling mechanism of towers as applied to a separate designated location of the vehicle frame to effectively straighten the frame of the vehicle.

U.S. Pat. No. 5,819,576

Inventor: Curtis A. Smith, Jr.

Issued: Oct. 13, 1998

Self-contained snowmobile straightening system with a repair table. The table includes a two-location anchoring system assuring that both the chassis and the suspension of the snowmobile are immobilized in place on the table so that repair work can be accomplished by adjustable and removable pulling equipment structurally associated with the repair table. The chassis is immobilized in place by at least one pair of opposed slide rail clamps which lock both slide rails of a

snowmobile in place on the table surface of the straightening system. The snowmobile suspension system is anchored by opposed pairs of running board clamps, while pulling towers and braces, in combination with hydraulic power rams, afford a repair craftsman many necessary multi-directional pulls.

European Publication Number EP 0 172 290

Inventor: Manuel Mora Agudo

Issued: Apr. 27, 1984

The apparatus consists of a parallelepipedal framework whose support face is formed by a series of sections (1) disposed transversely to its largest dimension. At least one section is arranged each meter and a half along the length of the apparatus with a view to imparting to it the necessary rigidity, together with other sections (2) disposed vertically and assembled to the first ones, while on the upper face there are only two sections (5) which determine its largest dimension and serve as rails for a travelling crane which can track along the entire length of the apparatus, so as to make it possible to insert and remove chassis and to replace chassis bodies.

Canadian Patent Number CA1,329,357

Inventor: Jean Gemme et al.

Issued: May 10, 1994

The apparatus includes a car-supporting platform fitted with a power operated lift for lifting the vehicle off the platform, so as to facilitate inserting clamps to secure the vehicle body to the platform. One or more L-shaped pulling arms are pivoted to the platform frame for swinging movement around the vehicle body, so as to enable pulling on the latter in any horizontal orientation. In a preferred embodiment, the platform is made of two pivotal sections which can be folded against each other, and the apparatus is provided with wheels, so that the same, with the platform in folded position, can be wheeled about and stored in a minimum of space when not in use.

While these frame devices may be suitable for the purposes for which they were designed, they would not be as suitable for the purposes of the present invention, as hereinafter described.

SUMMARY OF THE PRESENT INVENTION

The present invention relates generally to trailer bed frames and, more specifically, to a straightening system for trailer bed frames which have bent out of shape over time. The present invention is comprised of hydraulic rams, fastening elements, a control panel and a support structure. A bent trailer bed frame is secured to the support structure by the fastening elements. The bent trailer frame is straightened in response to the input of controls provided by the control panel. The control panel provides the user with control over the position and power of the hydraulic rams connected to the support structure. The force exerted by the hydraulic rams straightens the bent trailer frame.

A primary object of the present invention is to provide a trailer bed frame straightener that overcomes the shortcomings of the prior art.

Another object of the present invention is to provide a device for straightening the trailer frames used for supporting cargo containers.

Still another object of the present invention is to provide a frame straightening device having a support base including base plates positioned on each side of a floor guide.

Yet another object of the present invention is to provide a frame straightening device having a plurality of fastening elements.

Still yet another object of the present invention is to provide a frame straightening device wherein stanchions are positioned at a first distal end thereof at substantially a center of each respective one of the support base plates.

Another object of the present invention is to provide a frame straightening device wherein each stanchion has a pair of divergent support members extending from a predetermined point along a length thereof to its respective support base plate.

Yet another object of the present invention is to provide a frame straightening device wherein the stanchions support an upper support beam extending therebetween and fastened thereto at a distal end opposite the first distal end.

Still yet another object of the present invention is to provide a frame straightening device wherein the stanchions and upper support beams have tracks along their lengths.

Another object of the present invention is to provide a frame straightening device wherein the stanchion and upper support beam tracks have pivotally mounted hydraulic rams connected thereto.

Still another object of the present invention is to provide a frame straightening device wherein the hydraulic rams are operated by operational control inputs from a controller.

Another object of the present invention is to provide a frame straightening device wherein the hydraulic rams traverse along the track to align with the bent trailer frame.

Yet another object of the present claimed invention is to provide a frame straightening device wherein the hydraulic rams straighten a bent trailer frame by asserting force on the frame.

Still yet another object of the present invention is to provide a frame straightening device that is simple and easy to use.

A still further object of the present invention is to provide a frame straightening device that is economical and inexpensive to manufacture.

Additional objects of the present invention will appear as the description proceeds.

The present invention overcomes the shortcomings of the prior art by providing a trailer bed frame straightener comprised of sliding and pivoting hydraulic rams, fastening elements, a control panel and a support structure. A bent trailer bed frame is secured to the support structure by the fastening elements. The bent trailer frame is straightened in response to the input of controls provided by the control panel. The control panel provides the user with control over the position and power of the hydraulic rams connected to the support structure. The force exerted by the hydraulic rams straightens the bent trailer frame.

The foregoing and other objects and advantages will appear from the description to follow. In the description reference is made to the accompanying drawings, which forms a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments will be described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that structural changes may be made without departing from the scope of the invention. In the accompany-

ing drawings, like reference characters designate the same or similar parts throughout the several views.

The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is best defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

In order that the invention may be more fully understood, it will now be described, by way of example, with reference to the accompanying drawing in which:

FIG. **1** is an illustrative view of the application of frame straightening device of the present invention;

FIG. **2** is an illustrative view of the application of the frame straightening device of the present invention;

FIG. **3** is an illustrative view of the frame straightening device of the present invention;

FIG. **4** is an illustrative view of the frame straightening device of the present invention with a trailer bed frame unfastened;

FIG. **5** is an illustrative view of the frame straightening device of the present invention with a trailer bed frame fastened;

FIG. **6** is a rear view of the frame straightening device of the present invention in use;

FIG. **7** is an illustrative view of the forces applied by the frame straightening device of the present invention when in use;

FIG. **8** an exploded view of the shoe of the frame straightening device of the present invention;

FIG. **9** an assembled view of the shoe of the frame straightening device of the present invention;

FIG. **10** is an assembled view of the shoe of the frame straightening device of the present invention in use;

FIG. **11** is an enlarged view of a frame straightening anchor of the present invention;

FIG. **12** is an illustrative view of an alternate embodiment of the frame straightening device of the present invention in use;

FIG. **13** is an illustrative view of the control box of the frame straightening device of the present invention;

FIG. **14** is an illustrative view of the base of the hydraulic rams of the frame straightening device of the present invention; and

FIG. **15** is a flow diagram of the frame straightening device of the present claimed invention.

DESCRIPTION OF THE REFERENCED NUMERALS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, the Figures illustrate the frame straightening device of the present invention. With regard to the reference numerals used, the following numbering is used throughout the various drawing figures.

10 Frame straightening device of the present invention
12 Cargo container
14 Trailer bed frame
15 Desired level
16 Bed frame beams
17 Vertical directional arrows
18 Floor guide
19 Horizontal directional arrows
20 Securing post
21 Pivoting directional arrows
22 Stanchion
24 Upper support beam
26 Support base plate
28 Support members
30 Hydraulic ram
32 Track
34 Anchor fastener
36 Control box
38 Shoe driver
40 Hydraulic piston engaging member
42 Hydraulic piston engaging member aperture
44 Shoe
46 Hydraulic piston engaging member screws
48 Position slide control
50 Power switch
52 Strength knob
54 Status indicator LED
56 Chain
58 Wheels
60 Base
62 Motor
64 Hydraulic ram track
66 Pivoting motor

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The following discussion describes in detail one embodiment of the invention (and several variations of that embodiment). This discussion should not be construed, however, as limiting the invention to those particular embodiments, practitioners skilled in the art will recognize numerous other embodiments as well. For definition of the complete scope of the invention, the reader is directed to appended claims.

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. **1** through **15** illustrate the frame straightening device of the present invention which is indicated generally by the reference numeral **10**.

In the motor vehicle industry it is known that trailer frames bend out of shape over time due to heavy loads and wear. It is desirable to have a device to easily fix the bent frame of a trailer rather than purchase a new trailer frame. The present invention aims to provide a system to fix bent trailer frames by bending them back into a desired shape.

FIG. **1** is an illustrative view of the application of frame straightening device of the present invention. A cargo unit **12** is transported by a trailer bed frame **14**. The cargo unit **12** is generally placed onto the trailer bed frame **14** by a pulley system **13**. Instances of negligence or malfunction of the pulley system **13** can cause a bending of trailer bed frame **14** out from its original and most effective state. The force of a premature drop, caused by the breaking of a pulley or negligence by its operator, of cargo unit **12** of trailer bed frame **14** will exert enough force to bend trailer bed frame **14**. Additionally, the trailer bed frame **14** may bend from wear over time or transporting cargo units **12** which exceed its weight limits.

FIG. **2** is an illustrative view of the application of the frame straightening device of the present invention. Cargo unit's **12**, as shown in FIG. **1**, are transported by means of trailer bed frame **14**. Over time the beams **16** of trailer bed frame **14** bend out of shape and the level of support the cargo unit **12** can provide is dampened. Desired level **15**, shown herein as dotted lines, indicates the level at which the beams **16** of trailer

bed frame **14** once were positioned. The present invention aims to bend the beams **16** of trailer bed frame **14** back the desired level **15**.

FIG. **3** is an illustrative view of the frame straightening device of the present invention. The frame straightening device **10** of the present invention consists of a support structure, multiple hydraulic rams **30**, securing devices and floor guide **18**. The support structure includes support base plates **26**, stanchions **22**, support members **28** and an upper support **24**. A support base plate **26** is located on each lateral side of the floor guide **18**. A stanchion **22** is connected at a first distal end to substantially a center of each support base plate **26**. A control box **34** is affixed to a respective one of the stanchion **22** to provide user inputs for system control, as will be discussed further in reference to FIG. **13**. Support members **28** extend from support base plate **26** at identical angles to a predetermined location on each respective stanchion **22**. Support members **28** provide equal force on each side of stanchions **22** to help create a solid supported structure. The upper support **24** is connected at each distal end thereof to a distal end of each stanchion **22** opposite the first distaldistal end. The support **24** connects both stanchions **22** to one another. This connection provides support in a direction perpendicular to the support members **28**.

Both upper support beam **24** and stanchions **22** contain tracks positioned on an inner surface thereof. Hydraulic rams **30** are attached within these tracks on the stanchions **22** and upper support beam **24**. The tracks are available to guide movement of the attached hydraulic ram **30** in a parallel direction along the length of the respective stanchion **22** or upper support beam **24**. This connection will be discussed in detail in reference to FIG. **14**. Force from the hydraulic rams **30** is exerted on trailer bed frame **14**, shown in FIG. **4**, to bend frame **14** into a desired shape. The forces will be discussed in greater detail in reference to FIG. **7**.

A track **32** is positioned at each end of the floor guide **18**. The direction of the track runs parallel to the upper support beam **24**. To focus the force exerted by the hydraulic rams **30** at the center, securing posts **20** are positioned within track **32**. Securing posts **20** glide along track **32** and lock into place when securing the trailer **14** therebetween. Additional support is provided by to anchor fasteners **34** which allow for attachment to the trailer **14**.

FIG. **4** is an illustrative view of the frame straightening device of the present invention with an unfastened trailer bed frame. The straightening device of the present invention **10** aims to correct the shape of a trailer bed frame **14** that has bent out of shape. The frame straightening device **10** of the present invention consists of a support structure, multiple hydraulic rams **30**, securing devices and floor guide **18**. The support structure includes support base plates **26**, stanchions **22**, support members **28** and the upper support **24**. The support base plate **26** is located on each lateral side of floor guide **18**. The stanchion **22** is connected at a first distal end to substantially a center of each support base plate **26**. The control box **34** is affixed to a respective one of the stanchion **22** to provide user inputs for system control, as will be discussed further in reference to FIG. **13**. Support members **28** extend from support base plate **26** at identical angles to stanchion **22** to a predetermined position on the respective stanchion **22**. Support members **28** provide equal force on each side of stanchions **22** to help create a solid supported structure. The upper support **24** is connected at each distal end thereof to the distal end of each stanchion **22** opposite the first distal end. The support **24** connects both stanchions **22** to one another. This connection provides support in a direction perpendicular to the support members **28**.

Both upper support beam **24** and stanchions **22** contain tracks positioned on an inner surface thereof. Hydraulic rams **30** are attached within these tracks on the stanchions **22** and upper support beam **24**. When in a power off mode the hydraulic rams **30** attached to the stanchions **22** pan up to allow easy insertion of trailer bed frame **14** therebetween. The tracks are available to guide movement of the attached hydraulic ram **30** in a parallel direction along the length of the respective stanchion **22** or upper support beam **24**. This connection will be discussed in detail in reference to FIG. **14**. Force from the hydraulic rams **30** is exerted on trailer bed frame **14**, shown in FIG. **4**, to bend frame **14** into a desired shape. The forces will be discussed in greater detail in reference to FIG. **7**.

A track **32** is positioned at each end of the floor guide **18**. The direction of the track runs parallel to the upper support beam **24**. To focus the force exerted by the hydraulic rams **30** at the center, securing posts **20** positioned within track **32**. Securing posts **20** glide along track **32** and lock into place when securing trailer **14** therebetween. Additional support is provided by to anchor fasteners **34** which allow for attachment to the trailer **14**. The trailer frame **14** is positioned on the floor guide **18** waiting to be secured by securing posts **20** and optional anchor fasteners **34**.

FIG. **5** is an illustrative view of the frame straightening device of the present invention with a trailer bed frame fastened. The straightening device of the present invention **10** aims to correct the shape of a trailer bed frame **14** that has bent out of shape. The frame straightening device **10** of the present invention consists of a support structure, multiple hydraulic rams **30**, securing devices and floor guide **18**. The support structure includes support base plates **26**, stanchions **22**, support members **28** and the upper support **24**. The support base plate **26** is located on each side of floor guide **18**. A stanchion **22** is connected at a first distal end to substantially a center of each support base plate **26**. A control box **34** is affixed to a respective one of the stanchion **22** to provide user inputs for system control, as will be discussed further in reference to FIG. **13**. Support members **28** extend from support base plate **26** at identical angles to stanchion **22**. Support members **28** provide equal force on each side of stanchions **22** to help create a solid supported structure. The upper support **24** is connected at each distal end thereof to a distal end of each stanchion **22** opposite the first distal end. The support **24** connects both stanchions **22** to one another. This connection provides support in a direction perpendicular to the support members **28**.

Both upper support beam **24** and stanchions **22** contain tracks positioned on an inner surface thereof. Hydraulic rams **30** are attached within these tracks on the stanchions **22** and upper support beam **24**. When in a power off mode the hydraulic rams **30** attached to the stanchions **22** pan up to allow easy insertion of trailer bed frame **14**. The tracks are available to guide movement of the attached hydraulic ram **30** in a parallel direction along the length of the respective stanchion **22** or upper support beam **24**. This connection will be discussed in detail in reference to FIG. **14**. Force from the hydraulic rams **30** is exerted on trailer bed frame **14**, shown in FIG. **4**, to bend frame **14** into a desired shape. The forces will be discussed in greater detail in reference to FIG. **7**.

A track **32** is positioned at each end of the floor guide **18**. The direction of the track runs parallel to the upper support beam **24**. To focus the force exerted by the hydraulic rams **30** at the center, securing posts **20** positioned within track **32**. Securing posts **20** glide along track **32** and lock into place when securing trailer **14** therebetween. Additional support is provided by to anchor fasteners **34** which allow for attach-

ment to the trailer **14**. The trailer frame **14** is positioned on the floor guide **18** and fastened into a secure position by securing posts **20** and optional anchor fasteners **34**. This secure position provides a stationary force against the pressure of the hydraulic rams **30**.

FIG. **6** is a rear view of the frame straightening device of the present invention in use. The straightening device of the present invention **10** aims to correct the shape of a trailer bed frame **14** that has bent out of shape. The frame straightening device **10** of the present invention consists of a support structure, multiple hydraulic rams **30**, securing devices and floor guide **18**. The support structure includes support base plates **26**, stanchions **22**, support members **28** and an upper support **24**. A support base plate **26** is located on each side of floor guide **18**. Each stanchion **22** is connected at a first distal end to substantially a center of each support base plate **26**. The control box **34** is affixed to a respective one of the stanchions **22** to provide user inputs for system control, as will be discussed further in reference to FIG. **13**. Support members **28** extend from support base plate **26** at identical angles to stanchion **22** to predetermined position along the length. Support members **28** provide equal force on each side of stanchions **22** to help create a solid supported structure. The upper support **24** is connected at each distal end thereof to a distal end of each stanchion **22** opposite the first distal end. The support **24** connects both stanchions **22** to one another. This connection provides support in a direction perpendicular to the support members **28**.

Force from the hydraulic rams **30** is exerted on trailer bed frame **14** to bend frame **14** into a desired shape. The forces will be discussed in greater detail in reference to FIG. **7**. Hydraulic rams **30** are attached to the stanchions **22** and upper support beam **24**. Both upper support beam **24** and stanchions **22** contain tracks to guide movement of the attached hydraulic ram **30** in a parallel direction. Therefore, the upper hydraulic ram **30** moves in a horizontal direction as indicated by directional arrows **19** while the side hydraulic rams **30** move in a vertical direction as indicated by directional arrows **17**. The connection will be discussed in detail in reference to FIG. **14**. When in a power off mode the hydraulic rams **30** attached to the stanchions **22** pan up in a direction **21** to allow for easy insertion of trailer bed frame **14**.

FIG. **7** is an illustrative view of the forces applied by the frame straightening device of the present invention when in use. The straightening device of the present invention **10**, shown in FIG. **3**, aims to correct the shape of a trailer bed frame **14** that has bent out of shape. Three hydraulic rams **30** exert force on trailer bed frame **14**. The forces F**1** and F**2**, provided by side hydraulic rams **30**, are exerted in a horizontal direction against the stationary force of the securing post **20**, shown in FIG. **3**, to bend the frame **14** in a horizontal direction. The force R**1**, provided by upper hydraulic ram **30**, is exerted in a vertical direction against the stationary force of the floor guide **18** on the wheels of trailer bed frame **14** to bend the frame **14** in a downward direction. Trailer bed frame **14** may be turned upside down in order for upper hydraulic ram **30** to provide force in an opposite vertical direction. In an alternate embodiment, not shown, a fourth hydraulic pump may be provided beneath the trailer bed frame **14** as well as supports to hold the frame down.

FIG. **8** an exploded view of a shoe **44** of the frame straightening device of the present invention. The shoe **44** is available to be attached to the end of a hydraulic ram **30**, shown in FIG. **3**. The shoe **44** includes a rectangular hydraulic piston engaging member **40** and a shoe driver **38**. The hydraulic piston engaging member **40** is attached to the hydraulic pump **30** through hydraulic piston engaging member apertures **42**. Hydraulic piston engaging member apertures **42** are located above the connection base plate of hydraulic piston engaging member **40**. It is preferable that hydraulic piston engaging members **40** be attached to the ends of all hydraulic rams **30** of the present claimed invention at all times for speedier modification. The shoe driver **38** contains an elongated section to apply pressure to a greater area and a receiving connection located at the center. When it is preferable to bend a greater area, such as the span of the width of the frame **14** shown in FIG. **1**, the receiving connection of shoe driver **38** is slid over the connection base plate of hydraulic engaging piston engaging member **40**.

FIG. **9** an assembled view of the shoe of the frame straightening device of the present invention. The shoe **44** is available to be attached to the end of a hydraulic ram **30**, shown in FIG. **3**. The shoe **44** includes a rectangular hydraulic piston engaging member **40** and a shoe driver **38**. The hydraulic piston engaging member **40** is attached to the hydraulic pump **30** through hydraulic piston engaging member apertures **42**. Hydraulic piston engaging member apertures **42** are located above the connection base plate of hydraulic piston engaging member **40**. It is preferable that hydraulic piston engaging members **40** be attached to the ends of all hydraulic rams **30** of the present claimed invention at all times for speedier modification. The shoe driver **38** contains an elongated section to apply pressure to a greater area and a receiving connection located at the center. When it is preferable to bend a greater area, such as the span of the width of the frame **14** shown in FIG. **1**, the receiving connection of shoe driver **38** is slid over the connection base plate of hydraulic engaging piston engaging member **40** to create a secure connection.

FIG. **10** is an assembled view of the shoe of the frame straightening device of the present invention in use. The straightening device of the present invention **10** aims to correct the shape of a trailer bed frame **14** that has bent out of shape. The upper support beam **24** extends across the top of the straightening device **10** and provides a track for upper hydraulic ram **30**. An attachable shoe **44** is attached to the end of a hydraulic ram **30**. The shoe **44** includes a hydraulic piston engaging member **40** and a shoe driver **38**. The hydraulic piston engaging member **40** is attached to the hydraulic pump **30** by hydraulic piston engaging member apertures **42**. It is preferable that hydraulic piston engaging members **40** be attached to the ends of all hydraulic rams **30** of the present claimed invention for accelerated modification. A shoe driver **38** is slid onto hydraulic engaging piston engaging member **40** to provide a larger force area. This larger area can be used to exert simultaneous force on both bed frame beams **16** of trailer bed frame **14**.

FIG. **11** is an enlarged view of a frame straightening anchor of the present invention. Anchor fasteners **34** are located on support members **28** to provide complementary support. Chains or other fastening devices may be attached to anchor fasteners **34** and a trailer bed frame **14**, shown in FIG. **4**, to hold the frame **14** in place when force is being exerted on it from the hydraulic rams **30**, shown in FIG. **4**, of the present claimed invention.

FIG. **12** is an illustrative view of an alternate embodiment of the frame straightening device of the present invention in use. The straightening device of the present invention **10** aims to correct the shape of a trailer bed frame **14** that has bent out of shape. The frame straightening device **10** of the present invention consists of a support structure, multiple hydraulic rams **30**, securing devices and floor guide **18**. The support structure includes support base plates **26**, stanchions **22**, support members **28** and an upper support **24**. A support base plate **26** is located on each side of floor guide **18**. A stanchion

22 is connected at a first distal end to substantially a center of each support base plate **26**. A control box **34** is affixed to a respective one of the stanchion **22** to provide user inputs for system control, as will be discussed further in reference to FIG. **13**. Support members **28** extend from support base plate **26** at identical angles to stanchion **22**. Support members **28** provide equal force on each side of stanchions **22** to help create a solid supported structure. The upper support **24** is connected at each distal end thereof to a distal end of each stanchion **22** opposite the first distal end. The support **24** connects both stanchions **22** to one another. This connection provides support in a direction perpendicular to the support members **28**.

Both upper support beam **24** and stanchions **22** contain tracks positioned on an inner surface thereof. Hydraulic rams **30** are attached within these tracks on the stanchions **22** and upper support beam **24**. When in a power off mode the hydraulic rams **30** attached to the stanchions **22** pan up to allow easy insertion of trailer bed frame **14**. The tracks are available to guide movement of the attached hydraulic ram **30** in a parallel direction along the length of the respective stanchion **22** or upper support beam **24**. This connection will be discussed in detail in reference to FIG. **14**. Force from the hydraulic rams **30** is exerted on trailer bed frame **14**, shown in FIG. **4**, to bend frame **14** into a desired shape. The forces will be discussed in greater detail in reference to FIG. **7**.

A track **32** is positioned at each end of the floor guide **18**. The direction of the track runs parallel to the upper support beam **24**. To focus the force exerted by the hydraulic rams **30** at the center, securing posts **20** positioned within track **32**. Securing posts **20** glide along track **32** and lock into place when securing trailer **14** therebetween. The trailer frame **14** is positioned on the floor guide **18** and fastened into a secure position by securing posts **20** and optional anchor fasteners **34**. Additional support is provided by to anchor fasteners **34**. Chains **56** are attached to anchor fasteners **34** and placed around trailer bed frame **14** to solidify the position of the trailer frame **14**. This secure position provides a stationary force against the pressure of the hydraulic rams **30**. As the hydraulic rams **30** exert pressure onto trailer frame **14** the chains **56** and securing posts **20** provide an equal and opposite force on the stationary ends of trailer **14** creating a concentration of force from the hydraulic rams **30** to a specific area.

FIG. **13** is an illustrative view of the control box of the frame straightening device of the present invention. Control box **36** contains power position slide control **48**, power switches **50**, strength knobs **52** and status indicator LEDs **54**. The system is powered when system power switch **50** is toggled into the "on" position. Upon the toggle of system power switch **50** the system status indicator LED is activated and lights up. A set of controls is provided for each hydraulic ram **30**, shown in FIG. **3**. Power to each hydraulic ram **30** is provided upon the toggling of its respective power switch **50**. Upon the toggle of hydraulic ram power switch **50** respective status indicator LED **54** is lit. The position of the powered hydraulic ram **30** can be adjusted using position slide controls **48**. In a preferred embodiment a single position slide control **48** is provided for both side hydraulic ram control sets. The strength of pressure exerted by the powered hydraulic ram **30** is set by strength knob **52**. The actual pressure exerted by powered hydraulic ram **30** is proportional to the clockwise rotation of strength knob **52**. When hydraulic power switch **50** is toggled into the off position the respective hydraulic ram is powered off and its respective status LED indicator ceases to light up. When operations are complete the system is shut down by the toggling of system power switch **50**. Upon the toggling of system power switch **50** system status indicator LED **54** ceases to light up.

FIG. **14** is a magnified view of the base of the hydraulic rams **30** of the present claimed invention. Hydraulic rams **30** are attached to the stanchions **22** and upper support beam **24**. Both upper support beam **24** and stanchions **22** contain tracks **64** to guide movement of the attached hydraulic ram **30** in a parallel direction. Each hydraulic ram **30** is attached to a base **60** which connects the hydraulic ram **30** to the track along either stanchion **22** or upper support beam **24**. The base **60** includes two motors **62** and two wheels **58**. Each wheel **58** is driven by a motor **62**. The wheels **58** are operable to move the base **60** along the track to which it is attached. Pivoting motors **66** are located at the end of hydraulic ram **30** to pan the hydraulic ram **30** up in a powered off position.

FIG. **15** is a flow diagram of the user process of operation of the present claimed invention. The straightening device of the present invention aims to correct the shape of a trailer bed frame that has bent out of shape. To start the frame straightening process the user first inserts the bent trailer frame onto the floor guide in step S**100**. The user then powers on the system in step S**110**. When powered, the side hydraulic rams pan downwards into a level position. The trailer frame is secured in step S**120** by securing posts and fastening elements. At this point the trailer frame is ready to be straightened. Each hydraulic ram desired for use must be powered on as in steps S**130**, S**140** and S**150**. Once powered, the position of the hydraulic ram can be adjusted in step S**160** so the powered hydraulic ram may be at the same level as the trailer frame. A shoe may be attached to the hydraulic ram in step S**170** to spread the force exerted over a larger area. Once positioned and ready, the hydraulic ram is responsive to a strength input set in step S**180**. This setting increases and decreases the amount of force exerted on the frailer frame from the applicable hydraulic ram. Upon the completion of use of the powered hydraulic ram, the hydraulic ram is powered off as in step S**200**, S**190** and S**210**. Upon completion of the use of all hydraulic rams the system may be powered off in step S**220**. Upon powering the system off the side hydraulic rams pan up to make it easier to remove the trailer frame.

While certain novel features of this invention have been shown and described and are pointed out in the annexed claims, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed is new and desired to be protected by Letters Patent is set forth in the appended claims:

1. A device for re-shaping a trailer frame comprising:

a. a support structure for receiving said trailer frame therein;

b. means connected to said support structure for securing said trailer frame therein;

c. at least one hydraulic ram connected to and selectively moveable about said support structure for applying a predetermined force against said trailer frame;

d. a control device positioned on said support structure and connected to said at least one hydraulic ram for control-

ling operation thereof; wherein upon securing said trailer frame via said securing means, said at least one hydraulic ram is positioned adjacent said trailer frame and said control device is selectively operable to cause said at least one hydraulic ram to apply said predetermined force on said trailer frame thereby reshaping said trailer frame;

e. a shoe selectively connectable to a respective one of said at least one hydraulic rams at a distal end thereof for distributing said predetermined force over an increased area on said trailer frame; and

f. said support structure comprises:

a floor guide;

a first base plate connected on a first lateral side of said floor guide having a first stanchion extending upwardly therefrom at substantially a center thereof;

a second base plate connected on a second lateral side of said floor base plate opposite said first guide having a second stanchion extending upwardly therefrom at substantially a center thereof;

a plurality of angular support beams angularly extending between said base plate and a predetermined position along the length of each of said first stanchion and said second stanchion; and

an upper transverse support beam connecting said first stanchion with said second stanchion; wherein a receiving area is created bordered by said floor guide, said first stanchion, said second stanchion and said upper support, said receiving area is able to receive said trailer frame therein for reshaping thereof.

2. The device as recited in claim **1**, wherein each of said first stanchion, said second stanchion and said upper support include a ram track positioned on a surface thereof which borders said receiving area.

3. The device as recited in claim **2**, wherein said at least one hydraulic ram is connected within said track positioned on at least one of said first stanchion, said second stanchion and said upper support.

4. The device as recited in claim **2**, further comprising a first hydraulic ram positioned within and moveable along said track of said first stanchion.

5. The device as recited in claim **4**, further comprising a second hydraulic ram positioned within and moveable along said track of said second stanchion.

6. The device as recited in claim **5**, further comprising a third hydraulic ram positioned within and moveable along said track of said upper support .

7. The device as recited in claim **6**, wherein said control device allow for each of said first hydraulic ram, said second hydraulic ram and said third hydraulic ram to be operated independently from one another.

8. The device as recited in claim **1**, wherein said control device allows a user to selectively determine a force to be applied by said at least one hydraulic ram.

9. The device as recited in claim **1**, wherein said securing means comprises a plurality of anchor fasteners positioned on said support structure, wherein at least one chain is wrapped around said trailer frame and received through a respective one of said plurality of anchor fasteners thereby securing said trailer frame thereby.

10. The device as recited in claim **1**, wherein said securing means comprises:

a first track parallel to said upper support extending along a first edge of said floor guide;

a first pair of support posts positioned within said first track and moveable along a length thereof;

a second track parallel to said upper support extending along a second edge of said floor guide opposite said first edge;

a second pair of support posts positioned within said second track and moveable along a length thereof; wherein upon positioning said trailer frame in said receiving area, each of said first support posts and said second support posts are selectively moved towards a center of said floor guide thereby pressing said trailer frame therebetween.

11. The device as recited in claim **1** wherein said control device includes at least one of power switches, position controls, strength controls and status indicators.

12. The device as recited in claim **1**, wherein said at least one hydraulic ram is connected to said support structure via a base.

13. The device as recited in claim **12**, wherein said base allows said at least one hydraulic ram to pivot thereabout in a direction towards said support structure.

14. The device as recited in claim **13**, wherein said base comprises a motor causing said at least one hydraulic ram to pivot thereabout.

15. The device as recited in claim **12**, wherein said base comprises a movement motor and wheels received by said support structure for moving said at least one hydraulic ram thereabout.

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